



SEQUENCE LISTING

<110> VEIGA CHACON, ESTEBAN
DE LORENZO PRIETO, VICTOR
FERNANDEZ HERRERO, LUIS ANGEL

<120> GENERATION OF SPECIFIC ADHESION IN GRAM-NEGATIVE
BACTERIA BY MEANS OF ANCHORING IMMUNOGLOBULIN SINGLE
DOMAINS ON THEIR SURFACE WITH AUTOTRANSPORTERS

<130> 5352-104 US

<140> 10/586,245

<141> 2006-07-11

<150> PCT/EP2005/000444

<151> 2005-01-13

<150> ES P200400073

<151> 2004-01-14

<160> 12

<170> PatentIn version 3.5

<210> 1

<211> 5587

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
polynucleotide

<400> 1

acccgacacc atcgaatggc gcaaaacctt tcgcggtatg gcatgatagc gcccggaaga	60
gagtcaattc aggggtggtga atgtgaaacc agtaacgtta tacgatgtcg cagagtatgc	120
cggtgtctct tatcagaccg tttcccgcgt ggtgaaccag gccagccacg tttctgcgaa	180
aacgcgggaa aaagtggaag cggcgatggc ggagctgaat tacattccca accgcgtggc	240
acaacaactg gcgggcaaac agtcgttgct gattggcggt gccacctcca gtctggccct	300
gcacgcgccg tcgcaaattg tcgcggcgat taaatctcg gccgatcaac tgggtgccag	360
cgtgggtggg tcgatggtag aacgaagcgg cgtcgaagcc tgtaaagcgg cgggtgcacaa	420
tcttctcgcg caacgcgtca gtgggctgat cattaactat ccgctggatg accaggatgc	480
cattgctgtg gaagctgcct gcactaatgt tccggcggtta tttcttgatg tctctgacca	540
gacacccatc aacagtatta ttttctccca tgaagacggt acgcgactgg gcgtggagca	600
tctggtcgca ttgggtcacc agcaaatcgc gctggttagcg ggccattaa gttctgtctc	660
ggcgcgtctg cgtctggctg gctggcataa atatctcact cgcaatcaaa ttcagccgat	720

agcggaacgg	gaaggcgact	ggagtgccat	gtccggtttt	caacaaacca	tgcaaagtgt	780
gaatgagggc	atcgttccca	ctgcgatgct	ggttgccaac	gatcagatgg	cgctggggcg	840
aatgcgcgcc	attaccgagt	ccgggctgcg	cgttgggtgcg	gacatctcgg	tagtgggata	900
cgacgatacc	gaagacagct	catgttatat	cccgccgtta	accaccatca	aacaggattt	960
tgcctgctg	gggcaaacca	gcgtggaccg	cttgctgcaa	ctctctcagg	gccaggcggt	1020
gaagggcaat	cagctgttgc	ccgtctcact	ggtgaaaaga	aaaaccaccc	tggcgcccaa	1080
tacgcaaacc	gcctctcccc	gcgcgttggc	cgattcatta	atgcagctgg	cacgacaggt	1140
ttcccgactg	gaaagcgggc	agtgagcggt	acccgataaa	agcggcttcc	tgacaggagg	1200
ccgttttgtt	ttgcagccca	cctcaacgca	attaatgtga	gtagctcac	tcattaggca	1260
ccccaggctt	tacactttat	gcttccggct	cgtatgttgt	gtggaattgt	gagcggataa	1320
caatttcaca	caggaaacag	ctatgaccat	gattacgaat	ttctagataa	cgagggcaaa	1380
tcatgaaata	cctattgcct	acggcagccg	ctggattggt	attactcgcg	gcccagccgg	1440
ccatggctca	ggtgcagctg	gtggagtctt	ggggaggctc	ggtgcaggct	gggggggtctc	1500
tgagactctc	ctgcacagcc	cctggattca	cctccaatag	ctgccgcatg	gactggtacc	1560
gccaggctgc	agggaaagcag	cgcgagtggg	tctcatctat	tagtactgat	ggtcgcacaa	1620
gctatgcaga	ctccgtgaag	ggccgattca	ccatctccaa	agacaaagcc	aaggacacgg	1680
tgtatctgca	aatgaacagc	ctgaaacctg	aggacacggc	catctattac	tgtgccgtga	1740
ggacgaatgg	gtatcgtccg	caatctcacg	aatttcgcta	ctggggccccg	gggacccagg	1800
tcaccgtctc	ctcagcggcc	gcggcgctcg	gggccgaatt	cgtcgacggg	gcgccgggtgc	1860
cgtatccgga	tccgctggaa	ccgatcgaca	attcagccgc	aattagtatg	gcaaattccac	1920
gtccaccaac	accgcggggtc	gctgcggccg	tatttttcatt	ggatgattat	gatgcaaaag	1980
acaatagtga	atcatcaata	ggtaattttag	ctcgtgtaat	acctagaatg	ggaagggagt	2040
taattaatga	ttatgaagaa	atccccttgg	aggagttgga	agatgaagcg	gaagaagaac	2100
gtcgccaagc	aacgcaattc	cactccaaaa	gtcgtaaccg	tagagctata	tcatcggaac	2160
catcatctga	tgaagatgca	tctgaatcgg	tttccacatc	agacaaacac	cctcaagata	2220
atacgggaact	tcatgaaaaa	gttgagacgg	cgggtttaca	accaagagcc	gcgcagccgc	2280
gaaccaagc	cgccgcgcaa	gccgatgcag	tcagcaccaa	tactaactcg	gctttatctg	2340
acgcaatggc	aagcacgcaa	tctatcttgt	tggatacagg	tgcttactta	acacggcaca	2400
ttgcacaaaa	atcacgcgct	gatgccgaaa	aaaacagtgt	ttggatgtca	aacaccggtt	2460

atggccgtga	ttatgcttcc	gcacaatatc	gccggtttag	ttcgaaacgc	acgcaaacac	2520
aaatcggcat	tgaccgcagc	ttgtccgaaa	atatgcagat	aggcggagta	ttgacttact	2580
ctgacagtca	gcatactttt	gatcaggcgg	gcggcaaaaa	tacttttgtg	caagccaacc	2640
tttatggtaa	gtattattta	aatgatgctt	ggtatgtggc	cggcgatatt	ggtgcgggca	2700
gcttgagaag	cgggttacia	acgcagcaaa	aagcaaactt	taaccgaaca	agcatccaaa	2760
ccggccttac	tttgggcaat	acgctgaaaa	tcaatcaatt	cgagattgtc	cctagtgcgg	2820
gtatccgtta	cagccgcctg	tcactctgcag	attacaagtt	gggtgacgac	agtgttaaag	2880
taagttctat	ggcagtgaaa	acactaacgg	ccggactgga	ttttgcttat	cggtttaaag	2940
tcggcaacct	taccgtaaaa	cccttgttat	ctgcagctta	ctttgccaat	tatggcaaag	3000
gcggcgtgaa	tgtgggcggg	aaatccttcg	cctataaagc	agataatcaa	cagcaatatt	3060
cagcaggcgt	cgcgttactg	taccgtaatg	ttacattaaa	cgtaaattgg	agtattacia	3120
aaggaaaaca	attggaaaaa	caaaaatccg	gacaaattaa	aatacagatt	cgtttctaaa	3180
ataccaaatt	catagcaaaa	taaaatgccg	tctgaactca	agcttgacct	gtgaagtga	3240
aaatggcgca	cattgtgcga	catttttttt	gtctgccggt	taccgctact	gcgtcacgga	3300
tccccacgcg	ccctgtagcg	gcgcattaag	cgcggcgggt	gtgggtggta	cgcgcagcgt	3360
gaccgctaca	cttgccagcg	ccctagcgcc	cgtccctttc	gctttcttcc	cttcctttct	3420
cgccacgttc	gccggctttc	cccgtcaagc	tctaaatcgg	ggcatccctt	tagggttccg	3480
atttagtgct	ttacggcacc	tcgaccccaa	aaaacttgat	tagggtgatg	gttcacgtag	3540
tgggccatcg	ccctgataga	cggttttttc	ccctttgacg	ttggagtcca	cgttctttta	3600
tagtggactc	ttgttccaaa	ctggaacaac	actcaaccct	atctcgggtc	attcttttga	3660
tttataaggg	attttgccga	tttcggccta	ttgggttaaaa	aatgagctga	tttaacaaaa	3720
atttaacgcg	aattttaaca	aaatattaac	gtttacaatt	tcaggtggca	cttttcgggg	3780
aaatgtgcgc	ggaaccctta	tttgtttatt	tttctaaata	cattcaaata	tgtatccgct	3840
catgtcgaga	cgttgggtga	ggttccaact	ttcaccataa	tgaaataaga	tcactaccgg	3900
gcgtatTTTT	tgagttatcg	agattttcag	gagctaagga	agctaaaatg	gagaaaaaaa	3960
tcactggata	taccaccggt	gatatatccc	aatggcatcg	taaagaacat	tttgaggcat	4020
ttcagtcagt	tgctcaatgt	acctataacc	agaccgttca	gctggatatt	acggcctttt	4080
taaagaccgt	aaagaaaaat	aagcacaagt	tttatccggc	ctttattcac	attcttgccc	4140
gcctgatgaa	tgctcatccg	gagttccgta	tggcaatgaa	agacggtgag	ctgggtgat	4200

```

gggatagtgt tcacccttgt tacaccgttt tccatgagca aactgaaacg ttttcatcgc 4260
tctggagtga ataccacgac gatttccggc agtttctaca catatatcgc caagatgtgg 4320
cgtgttacgg tgaaaacctg gcctatttcc ctaaagggtt tattgagaat atgtttttcg 4380
tctcagccaa tccctgggtg agtttcacca gttttgattt aaacgtggcc aatatggaca 4440
acttcttcgc ccccgttttc accatgggca aatattatac gcaaggcgac aagggtgctga 4500
tgccgctggc gattcagggt catcatgccg tctgtgatgg cttccatgtc ggcagaatgc 4560
ttaatgaatt acaacagtac tgcgatgagt ggcagggcgg ggcgtaattt ttttaaggca 4620
gttattggtg cccttaaacg cctgggtgcta cgcctgaata agtgataata agcggatgaa 4680
tggcagaaat tcgaaagcaa attcgacccg gtcgtcgggt cagggcaggg tcgttaaata 4740
gccgcttatg tctattgctg gtttaccggt ttattgacta ccggaagcag tgtgaccgtg 4800
tgcttctcaa atgcctgagg ccagtttgct caggctctcc ccgtggaggt aataattgct 4860
cgacatgacc aaaatccctt aacgtgagtt ttcgttccac tgagcgtcag accccgtaga 4920
aaagatcaaa ggatcttctt gagatccttt ttttctgcgc gtaatctgct gcttgcaaac 4980
aaaaaaacca ccgctaccag cgggtggtttg tttgccggat caagagctac caactctttt 5040
tccgaaggta actggcttca gcagagcgca gataccaaat actgtccttc tagtgtagcc 5100
gtagttaggc caccacttca agaactctgt agcaccgcct acatacctcg ctctgctaata 5160
cctgttacca gtggctgctg ccagtggcga taagtcgtgt cttaccgggt tggactcaag 5220
acgatagtta ccggataagg cgcagcggtc gggctgaacg ggggggttcgt gcacacagcc 5280
cagcttggag cgaacgacct acaccgaact gagataccta cagcgtgagc tatgagaaag 5340
cgccacgctt cccgaaggga gaaaggcgga caggatatccg gtaagcggca gggtcggaac 5400
aggagagcgc acgagggagc ttccaggggg aaacgcctgg tatctttata gtcctgtcgg 5460
gtttcgccac ctctgacttg agcgtcgatt tttgtgatgc tcgtcagggg ggcggagcct 5520
atggaaaaac gccagcaacg cggccttttt acggttcctg gccttttgct ggccttttgc 5580
tcacatg 5587

```

<210> 2

<211> 5563

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 2

acccgacacc atcgaatggc gcaaaacctt tcgcggtatg gcatgatagc gcccggaaga	60
gagtcaattc aggggtggtga atgtgaaacc agtaacgtta tacgatgtcg cagagtatgc	120
cgggtgtctct tatcagaccg tttcccgcgt ggtgaaccag gccagccacg tttctgcgaa	180
aacgcgggaa aaagtggaag cggcgatggc ggagctgaat tacattccca accgcgtggc	240
acaacaactg gcgggcaaac agtcgttgct gattggcggt gccacctcca gtctggccct	300
gcacgcgccg tcgcaaattg tcgcggcgat taaatctcgc gccgatcaac tgggtgccag	360
cgtggtggtg tcgatggtag aacgaagcgg cgtcgaagcc tgtaaagcgg cgggtgcacaa	420
tcttctcgcg caacgcgtca gtgggctgat cattaactat ccgctggatg accaggatgc	480
cattgctgtg gaagctgcct gcactaatgt tccggcggtta tttcttgatg tctctgacca	540
gacacccatc aacagtatta ttttctccca tgaagacggg acgcgactgg gcgtggagca	600
tctggtcgca ttgggtcacc agcaaactgc gctgttagcg ggcccattaa gttctgtctc	660
ggcgcgtctg cgtctggctg gctggcataa atatctcact cgcaatcaaa ttcagccgat	720
agcggaaacgg gaaggcgact ggagtgccat gtccggtttt caacaaacca tgcaaatgct	780
gaatgagggc atcgttccca ctgcgatgct ggttgccaac gatcagatgg cgctgggcgc	840
aatgcgcgcc attaccgagt ccgggctgcg cgttggtgcg gacatctcgg tagtgggata	900
cgacgatacc gaagacagct catgttatat cccgcggtta accaccatca aacaggattt	960
tcgcctgctg gggcaaacca gcgtggaccg cttgctgcaa ctctctcagg gccaggcggg	1020
gaagggcaat cagctgttgc ccgtctcact ggtgaaaaga aaaaccaccc tggcgcccaa	1080
tacgcaaacc gcctctcccc gcgcgttggc cgattcatta atgcagctgg cacgacaggt	1140
ttcccgaactg gaaagcgggc agtgagcggg acccgataaa agcggcttcc tgacaggagg	1200
ccgttttggt ttgcagccca cctcaacgca attaattgtga gttagctcac tcattaggca	1260
ccccaggctt tacactttat gcttccggct cgtatgttgt gtggaattgt gagcggataa	1320
caatttcaca caggaaacag ctatgaccat gattacgaat ttctagagga gccttttttt	1380
tggagatttt caacgtgaaa aaattattat tcgcaattcc tttagttggt cctttctatt	1440
ctcacagtgc acttgaaacg aactcacgc agtctccact ctccctgtcc gtcaccctg	1500
gagagtcggc ctccatctcc tgcaggtata gtcagagcct cttccacagg aattggaaaa	1560
cctgggtgga ttggtacctg cagaagccag ggcagtctcc acaagtcctg atctatgcgg	1620
cttctattcg ggcctccggc gtccttgaca ggttcagtgg cagtgcctca ggcacagatt	1680

ttacactgaa	aatcagcagg	gtggaggctg	aggatggttg	ggtttattac	tgcatgcaag	1740
gtacacaccc	gtacactttt	ggccagggga	ccaagctgac	cgtcctaggt	gcggccgcgg	1800
cgtcgggggc	cgaattcgtc	gacggtgcgc	cggtgccgta	tccggatccg	ctggaaccga	1860
tcgacaattc	agccgcaatt	agtatggcaa	atccacgtcc	accaacaccg	cgggtcgctg	1920
cggccgtatt	ttcattggat	gattatgatg	caaaagacaa	tagtgaatca	tcaataggta	1980
athtagctcg	tgtaatacct	agaatgggaa	gggagttaat	taatgattat	gaagaaatcc	2040
ccttggagga	gttggaagat	gaagcgggaag	aagaacgtcg	ccaagcaacg	caattccact	2100
ccaaaagtcg	taaccgtaga	gctatatcat	cgggaaccatc	atctgatgaa	gatgcatctg	2160
aatcggtttc	cacatcagac	aaacaccctc	aagataatac	ggaacttcat	gaaaaagttg	2220
agacggcggg	tttacaacca	agagccgcgc	agccgcgaac	ccaagccgcc	gcgcaagccg	2280
atgcagtcag	caccaatact	aactcggctt	tatctgacgc	aatggcaagc	acgcaatcta	2340
tcttgttgga	tacaggtgct	tacttaacac	ggcacattgc	acaaaaatca	cgcgctgatg	2400
ccgaaaaaaaa	cagtgttttg	atgtcaaaca	ccggttatgg	ccgtgattat	gcttccgcac	2460
aatatcgccg	gtttagttcg	aaacgcacgc	aaacacaaat	cggcattgac	cgcagcttgt	2520
ccgaaaatat	gcagataggc	ggagtattga	cttactctga	cagtcagcat	acttttgatc	2580
aggcgggcgg	caaaaatact	tttgtgcaag	ccaaccttta	tggtaagtat	tatttaaagt	2640
atgcttggtg	tgtggccggc	gatattggtg	cgggcagctt	gagaagccgg	ttacaaacgc	2700
agcaaaaagc	aaactttaac	cgaacaagca	tccaaaccgg	ccttactttg	ggcaatacgc	2760
tgaaaatcaa	tcaattcgag	attgtcccta	gtgcgggtat	ccgttacagc	cgcctgtcat	2820
ctgcagatta	caagttgggt	gacgacagtg	ttaaagtaag	ttctatggca	gtgaaaacac	2880
taacggccgg	actggatttt	gcttatcggt	ttaaagtcgg	caaccttacc	gtaaaaccct	2940
tgttatctgc	agcttacttt	gcccaattatg	gcaaaggcgg	cgtgaatgtg	ggcggtaaata	3000
ccttcgccta	taaagcagat	aatcaacagc	aatattcagc	aggcgtcgcg	ttactgtacc	3060
gtaatgttac	attaaacgta	aatggcagta	ttacaaaagg	aaaacaattg	gaaaaacaaa	3120
aatccggaca	aattaaaata	cagattcggt	tctaaaatac	caaattcata	gcaaaaataaa	3180
atgccgtctg	aactcaagct	tgacctgtga	agtgaaaaat	ggcgcacatt	gtgcgacatt	3240
ttttttgtct	gccgtttacc	gctactgcgt	cacggatccc	cacgcgccct	gtagcggcgc	3300
attaagcgcg	gcgggtgtgg	tggttacgcg	cagcgtgacc	gctacacttg	ccagcgcctt	3360
agcgcgccgt	cctttcgctt	tcttcccttc	ctttctcgcc	acgttcgccg	gctttccccg	3420

tcaagctcta aatcggggca tccctttagg gttccgattt agtgctttac ggcacctcga	3480
ccccaaaaaa cttgattagg gtgatggttc acgtagtggg ccatcgccct gatagacggt	3540
ttttcgccct ttgacgttgg agtccacggt ctttaatagt ggactcttgt tccaaactgg	3600
aacaacactc aaccctatct cggctctattc ttttgattta taagggattt tgccgatttc	3660
ggcctattgg ttaaaaaatg agctgattta acaaaaattt aacgcgaatt ttaacaaaat	3720
attaacgttt acaatttcag gtggcacttt tcggggaaat gtgcgcggaa cccctatttg	3780
tttatttttc taaatacatt caaatatgta tccgctcatg tcgagacggt gggtgagggt	3840
ccaactttca ccataatgaa ataagatcac taccgggcgt attttttgag ttatcgagat	3900
tttcaggagc taaggaagct aaaatggaga aaaaaatcac tggatatacc accgttgata	3960
tatcccaatg gcatcgtaaa gaacattttg aggcathttca gtcagttgct caatgtacct	4020
ataaccagac cgttcagctg gatattacgg cctttttaaa gaccgtaaag aaaaataagc	4080
acaagtttta tccggccttt attcacattc ttgcccgcct gatgaatgct catccggagt	4140
tccgtatggc aatgaaagac ggtgagctgg tgatatggga tagtgttcac ctttgttaca	4200
ccgttttcca tgagcaaact gaaacgtttt catcgctctg gagtgaatac cacgacgatt	4260
tccggcagtt tctacacata tattcgcaag atgtggcgtg ttacggtgaa aacctggcct	4320
atttccttaa agggtttatt gagaatatgt ttttcgtctc agccaatccc tgggtgagtt	4380
tcaccagttt tgatttaaac gtggccaata tggacaactt cttcgcccc gttttcacca	4440
tgggcaaata ttatacgcaa ggcgacaagg tgctgatgcc gctggcgatt caggttcatc	4500
atgccgtctg tgatggcttc catgtcggca gaatgcttaa tgaattacaa cagtactgcg	4560
atgagtggca gggcggggcg taattttttt aaggcagtta ttggtgccct taaacgcctg	4620
gtgctacgcc tgaataagtg ataataagcg gatgaatggc agaaattcga aagcaaattc	4680
gacccggtcg tcggttcagg gcagggtcgt taaatagccg cttatgtcta ttgctggttt	4740
accggtttat tgactaccgg aagcagtgtg accgtgtgct tctcaaatgc ctgaggccag	4800
tttgctcagg ctctccccgt ggaggtaata attgctcgac atgacaaaaa tcccttaacg	4860
tgagttttcg ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga	4920
tccttttttt ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcgg	4980
ggtttgtttg ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag	5040
agcgcagata ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa	5100
ctctgtagca ccgcctacat acctcgctct gctaactctg ttaccagtgg ctgctgccag	5160

tggcgataag tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca 5220
 gcggtcgggc tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac 5280
 cgaactgaga tacctacagc gtgagctatg agaaagcgcc acgcttcccg aaggagagaaa 5340
 ggcgacagc tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc 5400
 agggggaaac gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg 5460
 tcgatttttg tgatgctcgt cagggggggc gagcctatgg aaaaacgcca gcaacgcggc 5520
 ctttttacgg ttctggcct tttgctggcc ttttgctcac atg 5563

<210> 3
 <211> 47
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 3
 ctatgcggcc cagccggcca tggctcaggt gcagctggtg gagtctt 47

<210> 4
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 4
 accctcatag ttagcgtaac g 21

<210> 5
 <211> 44
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 5
 ggcggtccga ctgctaactc tggacagggt cagctggtgg agtc 44

<210> 6
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 6

gagtcattct gcggccgctg aggagacggt

30

<210> 7

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 7

accccgctctc acaactccca ccagggttcca tccgcaggcg gtccgactgc taactctgga

60

<210> 8

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 8

attactcgcc ggccggtacc ccgtctcaca actccca

37

<210> 9

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 9

gagtcattct agaggagcct tttttttgga gat

33

<210> 10

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 10

ctgagatgag tttttgttct gcggcc

26

<210> 11

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 11

Ala Ala Ala Ala Gly Ala

1

5

<210> 12

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 12

Thr Pro Ser His Asn Ser His Gln Val Pro Ser Ala Gly Gly Pro Thr

1

5

10

15

Ala Asn Ser Gly

20